

REPORT ON ELECTRICAL EQUIPMENT.

3 SEP 1936

(OTHER THAN FOR THE PROPULSION OF THE VESSEL)

Received at London Office

Date of writing Report 19... When handed in at Local Office 2. 9. 1936 Port of Belfast.

No. in Survey held at Belfast Date, First Survey 1st Feb 1936 Last Survey 31st Aug. 1936
 Reg. Book. 37780 on the "Dunvegan Castle" (Number of Visits 29)

Built at Belfast By whom built Harland & Wolff Ltd. Yard No. 960 When built 1936

Owners The Union Castle Mail Steamship Co. Ltd Port belonging to

Electric Light Installation fitted by Harland & Wolff Ltd. Contract No. 960 When fitted 1936.

Is the Vessel fitted for carrying Petroleum in bulk No.

System of Distribution Two Wire Direct Current System

Pressure of supply for Lighting 220 volts, Heating 220 volts, Power 220 volts.

Direct or Alternating Current, Lighting Direct Power Direct

If alternating current system, state frequency of periods per second

Has the Automatic Governor been tested and found efficient when the whole load is suddenly thrown on or off Yes

Generators, do they comply with the requirements regarding temperature rise Yes, are they compound wound Yes
 are they over compounded 5 per cent. Yes, if not compound wound state distance between each generator

Where more than one generator is fitted are they arranged to run in parallel Yes, is an adjustable regulating resistance fitted in series with each shunt field Yes Have certificates of test results for machines under 100 kw. been submitted and approved Yes Have machines over 100 kw. been inspected by the Surveyors during manufacture and testing Yes

Are all terminals accessible, clearly marked, and furnished with sockets Yes, are they so spaced or shielded that they cannot be accidentally earthed, short circuited, or touched Yes Are the lubricating arrangements of the generators as per Rule Yes

Position of Generators Main generators in Aux. Motor Rm. Emerg. generator in Emerg. Dynam. Room is the ventilation in way of the generators satisfactory Yes are they clear of all inflammable material Yes if situated near unprotected woodwork or other combustible material, state distance of same horizontally from or vertically above the generators

are the generators protected from mechanical injury and damage from water, steam or oil Yes, are their axes of rotation fore and aft Yes

Earthing, are the bedplates and frames of the generating plant efficiently earthed Yes are the prime movers and their respective generators in metallic contact Yes Main Switch Boards, where placed Switchboard Platform Fore End of Auxiliary Motor Room

If the generators and main switchboard are not placed in the same compartment, is each generator provided with a fuse on each insulated pole as near as possible to the terminals of the generator, additional to that provided on the main switchboard

Switchboards, are they placed in accessible positions, free from inflammable gases and acid fumes Yes, are they protected from mechanical injury and damage from water, steam or oil Yes, if situated near unprotected woodwork or other combustible material, state distance of same horizontally from or vertically above the switchboards

are they constructed wholly of durable, non-ignitable non-absorbent materials Yes, is all insulation of high dielectric strength and of permanently high insulation resistance Yes

is it of an approved type Yes, if semi-insulating material is used, are all conducting parts insulated from the slab with mica or micanite or other non-hygroscopic insulating material, and the slab similarly insulated from its framework

are the fittings as per Rule regarding: — spacing or shielding of live parts Yes, accessibility of all parts Yes, absence of fuses on back of board Yes, temperature rise of omnibus bars Yes, individual fuses to voltmeter, pilot or earth lamp Yes, are moving parts of switches alive in the "off" position No are all screws and nuts securing connections effectively locked Yes are any fuses fitted on the live side of switches

Main Switchgear, description of switchgear for each generator and each outgoing circuit, and arrangement of equalizer switches D.P. Overload Reverse Current Circuit Breaker with Time Limits & Interlocked Equalizer Switch for each generator and D.P. Overload Circuit Breaker for each Outgoing Circuit

Are turbine driven generators fitted with emergency trip switch as per rule

Are cupboards or compartments containing switchboards composed of fire-resisting material or lined with approved material Yes Instruments on main switchboard 4 Watt Hour Meters ammeters 2

voltmeters Arranged for paralleling purposes. For compound machines is the ammeter connected on the opposite pole to equaliser connection Yes

Earth Testing, state what means are provided at the main switchboard for indicating the state of the insulation of the system Earth Lamps controlled by D.P. Two Way Switch (Main Busbars Switches, Circuit Breakers and Fusible Cut-outs, & Emerg. Busbars) and protected by Fuses.

do these comply with the requirements of the Rules Yes are the fusible cutouts of an approved type Yes have the reversed

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current protection devices been tested under working conditions. Yes

Joint Boxes, Section and Distribution Boards, is the construction, protection, insulation, material, and position of these as per rule Yes

Cables: Single, twin, concentric, or multicore Yes are the cables insulated and protected as per Tables IV, V, X or XI of the Rules Yes

If the cables are insulated otherwise than as per Rule, are they of an approved type Yes

Fall of Pressure, state maximum between bus bars and any point of the installation under maximum load 11.0 P.S.I. Emergency Bilge Pump

Cable Sockets, are the ends of all cables having a sectional area of 0.04 square inch and above provided with soldering sockets Yes

Paper Insulated and Varnished Cambric Insulated Cables, If conductors are paper or varnished cambric insulated, is the dielectric at the exposed ends of the conductor protected from moisture by being suitably sealed with insulating compound Yes, or waterproof insulating tape Yes

Cable Runs, are the cables fixed as far as possible in accessible positions not exposed to drip or accumulation of water or oil, or to high temperature from boilers, steam pipes, uptakes or other hot objects, or to avoidable risk of mechanical damage Yes Are cables in machinery spaces, galleys, laundries, bathrooms and lavatories lead covered or run in conduit Yes

Support and Protection of Cables, state how the cables are supported and protected Clipped to Perforated Steel Plating or Wood Lathing

If cables are run in wood casings, are the casings and caps secured by screws Yes, are the cap screws of brass Yes, are the cables run in separate grooves Yes If armoured and lead covered cables are secured by metal clips, are the clips spaced as per Table VIII Yes

Refrigerated Chambers, are the cables and fittings in accordance with the special requirements Yes

Joints in Cables, state if any, and how made, insulated, and protected in specially constructed & insulated joint boxes

Watertight Glands and Deck Tubes, are all cables passing through decks and watertight bulkheads provided with deck tubes or watertight glands Yes

Bushes in Beams and Non-watertight Partitions, where unarmoured cables pass through beams and non-watertight partitions, are the holes efficiently bushed Yes state the material of which the bushes are made Lead

Earthing Connections, state what earthing connections are fitted and their respective sectional areas All Metal Portable Fittings not Fitted to Framework of Ship are Earthed with Connector Equivalent to Working Conductor.

Alternative Lighting, are the groups of lights in the propelling machinery space arranged as per Rule Yes

Emergency Supply, state position and method of control of the emergency supply and how the generator is driven Emergency generator Direct coupled to Diesel Engine situated in House B Deck aft controlled from Emergency Switchboard in same House.

Navigation Lamps, are these separately wired Yes, controlled by separate switch and separate fuses Yes, are the fuses double pole Yes

are the switches and fuses grouped in a position accessible only to the officers on watch Yes

has each navigation lamp an automatic indicator as per Rule Yes

Secondary Batteries, are they constructed and fitted as per Rule Yes

Fittings, are all fittings on weather decks, in stokeholds and engine rooms and wherever exposed to drip or condensed moisture, watertight Yes

are any fittings placed in spaces in which goods are liable to be stacked in close proximity to them; if so, how are they protected Yes

are any fittings placed in spaces where inflammable or explosive dust or gases are liable to be present, if so, how are they protected Yes

how are the cables led Yes

where are the controlling switches situated Yes

are all fittings suitably ventilated Yes, are all switches and lampholders constructed wholly of non-ignitable, non-absorbent materials Yes

Heating and Cooking Appliances, are they constructed and fitted as per Rule Yes, are air heaters constructed and fitted as per Rule Yes

Searchlight Lamps, No. of 2 for Lifeboats, whether fixed or portable Portable, are their fittings as per Rule Yes

Arc Lamps, other than searchlight lamps, No. of —, are their live parts insulated from the frame or case —, are their fittings as per Rule —

Motors, are their working parts readily accessible Yes, are the coils self-contained and readily removable for replacement Yes

are the brushes, brush holders, terminals and lubricating arrangements as per Rule Yes, are the motors placed in well-ventilated compartments in which inflammable gases cannot accumulate and clear of all inflammable material Yes

are they protected from mechanical injury and damage from water, steam or oil Yes are their axes of rotation fore and aft Horizontal Type Yes, if situated near unprotected woodwork or other combustible material, are the motors of the totally enclosed, pipe ventilated, forced draught, drip or flame proof type —

if not of this type, state distance of the combustible material horizontally or vertically above the motors — and —

have machines of over 100 BHP been inspected by the Surveyors during manufacture and testing Yes

Control Gear and Resistances, are the generator field and motor speed regulators, starters and controllers constructed and fitted as per Rule Yes

Lightning Conductors, where lightning conductors are required, are these fitted as per Rule —

Ships carrying Oil having a Flash Point less than 150° F. Have the special requirements of the Rules been complied with regarding switches, joint boxes, section and distribution boards, protection of cables, method of distribution, lead of cables, lights and fittings —

are all fuses of the filled cartridge type — are they of an approved type —

If portable lamps for use in dangerous spaces are supplied, are they of a self-contained, battery-fed type approved by the Home Office —

Spare Gear, if the vessel is for open sea service have spares been supplied as per Rule Yes

DESCRIPTION	NO. OF MOTORS	CONDUCTORS		COMPOSITION OF STRAND		TOTAL MAXIMUM CURRENT AMPS.		APPROXIMATE LENGTH LEAD RETURN FEET	INSULATED WITH	HOW PROTECTED
		NO. PER POLE	TOTAL EFFECTIVE AREA PER POLE SQ. IN.	NO.	DIA.	IN CIRCUIT	RULE			
Motor Room Fans	4	1	.04	19	.052	59	64	330	Rubber	Hard Rubber
Tunnel Fan	1	1	.003	3	.036	6	12	225	do.	do.
Refrig. Fans 2 H.P.	3	1	.003	3	.036	6	12	600	do.	do.
do. 7 1/2 H.P.	2	1	.0145	7	.052	30	37	240	do.	do.
do. 8 H.P.	5	1	.0145	7	.052	32	37	160	do.	do.
do. 11 1/2 H.P.	2	1	.0225	7	.064	46	46	270	do.	do.
Waste Heat Blower	2	1	.007	7	.036	16	24	60	do.	do.
Hot Oil Pumps	2	1	.0145	7	.052	32	37	195	do.	do.
Sprinkler Pump	1	1	.25	37	.093	198	214	165	do.	do.
Sprinkler Compressor	1	1	.003	3	.036	6	12	155	do.	do.
Sawage Ejectors	2	1	.06	19	.064	64	83	750	do.	do.
Oil Pumps Fans	2	1	.007	7	.036	18	24	330	do.	do.
Branes	2	1	.007	7	.036	20	24	155	do.	do.
Motor Room Hoist	1	1	.007	7	.036	20	24	165	do.	do.
Outboard Winch	1	1	.0045	7	.029	12	18.2	185	do.	do.
Auxiliary Winch	2	1	.0225	7	.064	40	46	300	do.	do.
Auxiliary Winch	2	1	.01	7	.044	28	31	255	do.	do.
Low Pressure Generator	1	1	.007	7	.036	17	24	120	do.	do.
Galvanic Water Fans	6	1	.002	3	.029	4	7.8	120	do.	do.
Waste Condenser Pump	1	1	.003	3	.036	9	12	65	do.	do.
Lathe	1	1	.003	3	.036	7	12	60	do.	do.
Drilling Machine	1	1	.003	3	.036	9	12	50	do.	do.
Shaping Machine	1	1	.0045	7	.029	16	18.2	45	do.	do.
Grinding Machine	1	1	.003	3	.036	9	12	55	do.	do.
Fuel Oil Service Pumps	3	1	.0045	7	.029	12	18.2	180	do.	do.
Fuel Oil Purifier	2	1	.0045	7	.029	12	18.2	175	do.	do.
Fuel Oil Purifier	3	1	.0045	7	.029	12	18.2	60	do.	do.
Fuel Oil Purifier	3	1	.003	3	.036	8	12	120	do.	do.
Fuel Oil Service Pump	1	1	.003	3	.036	8	12	610	do.	do.
W.P. Door Motor	1	1	.0225	7	.064	45/23	46	900	do.	do.
do. No. 1	1	1	.0225	7	.064	6/28	46	860	do.	do.
do. No. 3	1	1	.0225	7	.064	6/28	46	860	do.	do.
do. No. 4	1	1	.0225	7	.064	4.5/23	46	860	do.	do.
do. No. 5	1	1	.0225	7	.064	4.5/23	46	1,000	do.	do.
Boat Winches 15 B.H.P.	2	1	.04	19	.052	60	64	330	do.	do.
Boat Winches 10 B.H.P.	10	1	.0225	7	.064	40	46	520	do.	do.
Hydro Extractor Laundry	1	1	.0145	7	.052	33	37	90	do.	do.
Potato Washing Machine	1	1	.0045	7	.029	12	18.2	75	do.	do.
Excelsior Spring	1	1	.003	3	.036	8	12	75	do.	do.
Print. Buff. Roller	1	1	.002	3	.029	3	7.8	105	do.	do.
Ironing M. J.	1	1	.002	3	.029	1.0	7.8	75	do.	do.
12" Dial that Laundry	1	1	.002	3	.029	1.0	7.8	75	do.	do.
L.O. Compressor	3	1	1.0	127	.103	480	595	180	do.	do.
Brine Pumps 10 H.P.	3	1	.0225	7	.064	40	46	185	do.	do.
do. 7 1/2 H.P.	2	1	.01	7	.044	30	31	195	do.	do.
do. 4 H.P.	3	1	.0045	7	.029	17	18.2	160	do.	do.
Water Service Pumps	2	1	.04	19	.052	48	64	180	do.	do.
Refrigerator Compressor	2	1	.003	3	.036	8	12	150	do.	do.
Dehydrator Fan	1	1	.002	3	.029	1.3	7.8	210	do.	do.
Hallmark 1/2 H.P.	2	1	.002	3	.029	2	7.8	45	do.	do.
do. 3/4 "	6	1	.002	3	.029	3	7.8	45	do.	do.
do. 1 "	1	1	.002	3	.029	4	7.8	45	do.	do.
do. 2 "	1	1	.003	3	.036	8	12	45	do.	do.
do. 3 "	1	1	.0045	7	.029	12	18.2	45	do.	do.
Galley Blowers	2	1	.002	3	.029	4	7.8	35	do.	do.
Perless Vent Purposes	1	1	.0045	7	.029	12.5	18.2	50	do.	do.
Ice Cream M.	1	1	.003	3	.036	8	12	55	do.	do.
Koffee M.	1	1	.002	3	.029	1.5	7.8	80	do.	do.
Looph M.	1	1	.0045	7	.029	12	18.2	65	do.	do.
Printing M.	1	1	.002	3	.029	5	7.8	80	do.	do.
Stores Winch	1	1	.0045	7	.029	12	18.2	240	do.	do.
Baker's Oven	1	1	.075	19	.072	82	97	160	do.	do.
Engineer's Lift	1	1	.003	3	.036	10	12	300	do.	do.
Galley Lift	1	1	.003	3	.036	7	12	225	do.	do.
Passenger Lift	1	1	.01	7	.044	24	31	240	do.	do.

PARTICULARS OF GENERATING PLANT.

DESCRIPTION OF GENERATOR.	No. of	RATED AT				DRIVEN BY	WHERE DRIVEN BY AN INTERNAL COMBUSTION ENGINE.	
		Kilowatts.	Volts.	Ampères.	Revs. per Min.		Fuel Used.	Flash Point of Fuel.
MAIN ...	4	350	222	1590	300	Diesel Engine		
AUXILIARY ...	—							
EMERGENCY ...	1	50	222	227	1,000	Diesel Engine		
ROTARY TRANSFORMER								

GENERATOR, LIGHTING AND HEATING CONDUCTORS.

DESCRIPTION.	CONDUCTORS.		COMPOSITION OF STRAND.		TOTAL MAXIMUM CURRENT AMPERES.		Approximate Length (Lead and Return.) Feet.	Insulated with	HOW PROTECTED.
	No. per Pole.	Total Nominal Area per Pole Sq. Ins.	No.	Diameter.	In Circuit.	Rule.			
MAIN GENERATOR ...	2	1.5	Copper Bars	1590	1590	486	25' gen to board		Encased in metal framework.
EQUALISER CONNECTIONS ...	1	.75	do.	795	795	222	21' do.		do.
AUXILIARY GENERATOR ...	—								
EMERGENCY GENERATOR ...	1	.3	37	.103	227	240	50	Rubber	Hard Rubber.
ROTARY TRANSFORMER } MOTOR GENERATOR ...									
ENGINE ROOM ...									
BOILER ROOM ...									
AUXILIARY SWITCHBOARDS									
A 2nd Preference	1	.5	61	.103	375	486	300	Varnished	Lead covered & braided
B 1st do.	1	.15	37	.072	125	222	200	Cambric	do.
B 2nd do.	1	1.0	127	.103	690	839	520	do.	do.
C 1st do.	1	.6	91	.093	380	561	300	do.	do.
C 2nd do.	1	.85	127	.093	620	733	300	do.	do.
D 1st do.	1	.3	37	.103	195	346	220	do.	do.
D 2nd do.	1	.3	37	.103	270	346	220	do.	do.
E 1st do.	1	.5	61	.103	350	486	270	do.	do.
E 2nd do.	1	1.0	127	.103	1700	839	200	do.	do.
F 1st do.	1	1.0	127	.103	1700	839	200	do.	do.
G 1st do.	1		Copper Bar.	260	260	639		do.	do.
ACCOMMODATION								Part of main switch board.	
H 1st Preference	1	1.0	127	.103	820	839	270	Varnished	Lead covered & braided
J 1st do.	1	.85	127	.093	560	733	270	do.	do.
K 2nd do.	1	1.0	127	.103	626	839	910	do.	do.
WIRELESS ...	1	.0225	7	.064	27.8	46	1020	Rubber	Hard Rubber.
SEARCHLIGHT ...									
MASTHEAD LIGHT ...	1	.002	3	.029	0.18	7.8	800	Rubber	Hard Rubber and Lead covered up Mast.
SIDE LIGHTS ...	1	.002	3	.029	0.18	7.8	120	do.	Hard Rubber
COMPASS LIGHTS ...	1	.002	3	.029	0.18	7.8	30	do.	do.
POOP LIGHTS ...									
CARGO LIGHTS ...	1	.075	19	.072	42	97	1350	Rubber	Hard Rubber.
ARC LAMPS ...									
HEATERS ...									

MOTOR CONDUCTORS.

DESCRIPTION.	No. of Motors.	CONDUCTORS.		COMPOSITION OF STRAND.		TOTAL MAXIMUM CURRENT AMPERES.		Approximate Length (Lead and Return.) Feet.	Insulated with	HOW PROTECTED.
		No. Per Pole.	Total Nominal Area per Pole Sq. Ins.	No.	Diameter.	In Circuit.	Rule.			
Ballast Pump	2	1	.06	19	.064	72	83	180	Rubber	Hard Rubber.
Fire & Bilge	1	1	.10	19	.083	100	118	165	do.	do.
Emergency Bilge Pump	1	1	.04	19	.052	56	64	900	Rubber	Hard Rubber and Lead covered.
Sanitary Pump	1	1	.10	19	.083	105	118	195	do.	Hard Rubber.
Circ. Sea Water Pumps	4	1	.10	19	.083	112	118	190	do.	do.
Circ. Fresh Water Pumps	2	1	.06	19	.064	81	83	225	do.	do.
Air Compressor	2	1	.50	61	.103	320	332	150	do.	do.
Fresh Water Pump	2	1	.0145	7	.052	33	37	90	do.	do.
Engine Turning Gear	2	1	.0225	7	.064	40	46	245	do.	do.
aux. engine turning gear	4	1	.003	3	.036	9	12	80	do.	do.
Reversing Gear	4	1	.40	61	.093	278	288	255	do.	do.
Lubricating Oil Pumps	2	1	.01	7	.044	30	310	240	do.	do.
Oil Fuel Transfer Pump	1	1	.50	61	.103	352	534	230	do.	do.
Windlass	2	1	.15	37	.072	190	191	105	do.	do.
Winches, Forward	4	1	.10	19	.083	118	142	120	do.	do.
Winches, Aft	6	1	.10	19	.083	118	142	795	do.	do.
Warping Winch	1	1	.50	61	.103	370	534	175	do.	do.
Constant Steering Gear	2	1	.50	61	.103	375	534	90	do.	do.
(a) Main Motor	2	1	.12	37	.064	102	130	240	Rubber	Hard Rubber
(b) MAIN MOTOR	2	1	.12	37	.064	102	130	240	Rubber	Hard Rubber
Ventilating Fans 0.15 B.H.P.	2	1	.002	3	.029	.9	7.8	800	Rubber	Hard Rubber
do. 0.35 do.	2	1	.002	3	.029	2.1	7.8	800	do.	do.
do. 1.00 do.	4	1	.002	3	.029	4.7	7.8	270	do.	do.
do. 1.50 do.	3	1	.002	3	.029	6.7	7.8	300	do.	do.
do. 2.15 do.	7	1	.003	3	.036	9.5	12.0	270	do.	do.
do. 2.65 do.	6	1	.003	3	.036	11.2	12.0	300	do.	do.
do. 3.65 do.	7	1	.0045	7	.029	15.2	18.2	300	do.	do.
do. 4.3 do.	3	1	.007	7	.036	17.6	24.0	800	do.	do.
do. 5.0 do.	2	1	.007	7	.036	20.4	24.0	220	do.	do.

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All Conductors are of annealed copper conforming to British Standard Specification No. 7 (or International Electro-technical Commission Publication No. 28).

The Insulated Conductors are guaranteed to withstand the immersion and resistance tests specified in the Rules.

The foregoing is a correct description.



Electrical Engineers.

Date AUG. 19TH. 1936.

COMPASSES.

Distance between electric generators or motors and standard compass 120 Feet 10' to Nearest Motor.

Distance between electric generators or motors and steering compass 105 Feet 21' to Nearest Motor.

The nearest cables to the compasses are as follows:—

A cable carrying 40 Ampères 12 feet from standard compass 15 feet from steering compass.

A cable carrying 35 Ampères 13 feet from standard compass 16 feet from steering compass.

A cable carrying 50 Ampères 10 feet from standard compass 13 feet from steering compass.

Have the compasses been adjusted with and without the electric installation at work at full power Yes

Has the effect of switching on and off circuits, motors and other electro-magnetic apparatus within the vicinity of the compasses been noted Yes

The maximum deviation due to electric currents was found to be nil degrees on All course in the case of the standard compass, and nil degrees on All course in the case of the steering compass.



Builder's Signature.

Date AUG. 19TH. 1936.

Is this installation a duplicate of a previous case Yes If so, state name of vessel DUNNOTTAR CASTLE

General Remarks (State quality of workmanship, opinions as to class, &c.)

This installation has been fitted on board under special survey and in accordance with the approved plans, has been tested under full working conditions & found satisfactory. The materials and workmanship have been found to be good & sound.

Total Capacity of Generators 1450. Kilowatts.

The amount of Fee ... Bill £ 81 : 5 : 2-9-36 When applied for, 40-12-6 40-12-6 When received, Travelling Expenses (if any) £ 12-9-36 14/9

Charles W Hunter & R.C. Clayton Surveyors to Lloyd's Register of Shipping

Committee's Minute TUE. 8 SEP 1936

Assigned

See Bel. Rpt. 11806

2m.5.34.- Transfer. The Surveyors are requested not to write on or below the space for Committee's Minute.)



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